

Proposed Grayson Repowering Project

Unit 9 Separation

Attachment 1 – Scope of Work



A. GENERAL

The City of Glendale (City), through its municipal utility department, Glendale Water & Power (GWP) (together, the “City”) is currently pursuing the Grayson Power Plant Repowering Project (“Proposed Project”). The Grayson Power Plant (Grayson) is located at 800 Air Way, Glendale, CA 91201, just north of the Interstate 5 and Highway 134 interchange.

The Grayson Power Plant consists of:

- Units 1-5 - five boiler/steam turbine units
- Units 8A and 8BC – an FT-4 Power-Pac and an FT-4 Twin-Pac with heat recovery that produce steam for the Units 1 and 2 steam turbines
- Unit 9 – a GE LM6000 PC SPRINT gas turbine operating in simple cycle

The City is undertaking an environmental review of the proposed repowering under the California Environmental Quality Act. The environmental review evaluates the originally Proposed Project and two new Alternatives:

Alternative 7

- Retain Unit 9
- Demolish all other existing units at Grayson
- Construct 75 MW/300MWH of battery energy storage system (BESS)
- Construct approximately 93 MW of Wartsila gas engine
- Construct a new Glendale Switching Station

Alternative 8

- Retain Unit 9 and only the gas turbine generator portions, including their foundations, of Units 8A and 8BC
- Demolish all other existing units at Grayson including all of Units 8A and 8BC excepting the gas turbine generators and their foundations
- Construct approximately 75 MW/300MWH of battery energy storage system (BESS)
- Refurbish existing Units 8A and 8BC gas turbine generators and construct new balance of plant to convert Unit 8A to simple cycle and Unit 8BC to a fast start combined cycle
- Construct a new Glendale Switching Station

A Partially Recirculated Draft Environmental Impact Report (PR-DEIR) that evaluates the potential environmental impacts of these two new alternatives is currently in the public comment phase and City staff anticipates that the Final Environmental Impact Report for the proposed repowering project will be considered for certification by the City's governing body, the Glendale City Council, in November 2021. At the same City Council meeting where the Environmental Impact Report is considered for certification, the City Council will also be asked to make a determination of which project or project Alternative will be implemented.

For the originally-proposed project as well as for both of the alternatives described above, Unit 9 will be retained and continue to operate during the demolition and construction phases. To do so, it is necessary to separate Unit 9 from the rest of the units that will be demolished with which it shares some services such as the control room, demineralized

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water supply, etc. In addition, there are other changes that must be implemented in conjunction with the Unit 9 work to isolate or modify systems so the plant is ready for demolition. The purpose and scope of the Unit 9 Separation work is to implement these needed changes.

B. MAJOR ELEMENTS OF WORK

The Work includes three major elements:

- Separation of Unit 9 from other plant services that will be demolished, and replacement with alternate services such that Unit 9 can operate independently during the demolition and construction phases of the repowering project.
- Separation of the units to be demolished from plant utilities so the units can be safely demolished and the utilities can continue to serve Unit 9.
- Relocation of plant utilities that must remain during demolition and construction but must be relocated out of the areas to be demolished.

C. PHASING OF WORK

The Work will be performed in three phases:

Phase 1 – All Work that can be done while all of the units remain in operation as well as all pre-work for Phase 2.

Phase 2 – All of the units, including Unit 9 will be shutdown. Because all units will be shutdown, this Work must be completed within a two-week time period. After Phase 2, only Unit 9 will be capable of operation.

Phase 3 – Completion of any remaining Work. Such Work cannot impact the operability of Unit 9. Completion of Phase 3 is a prerequisite to the start of demolition which is the subject of a separate procurement and contracting process.

D. SCHEDULE

The Contractor may mobilize to the site once the Agreement is signed, the City has received proof of insurance and other required documents, and the City has issued a Notice to Proceed.

The Contractor must complete their work within ninety (90) calendar days of the Notice to Proceed with the exception, if needed, of installing the backup air compressor.

The City plans to have installed a pole mounted disconnect with a service drop prior to Notice to Proceed.

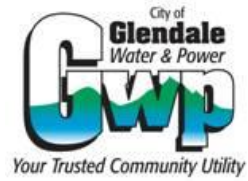
Unit 9 may only be out of service and unable to generate power for a maximum period of two weeks.

E. CITY SUPPLIED EQUIPMENT

The City will be supplying the following equipment and materials:

1. Office furniture - Tables, desks, bookcases, etc. to be moved by the Contractor from GWP's on-site offices into the trailers.
2. Pole mount disconnects - 4 kV disconnects that will be installed by GWP.
3. Pad-mount transformer – 4 kV/480 V 500 kVA pad-mount transformer to be installed by GWP

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4. Reverse Osmosis Skids – relocate the two (2) reverse osmosis skids (RO units with integral pumps) and associated chemical injection skids from the Boiler Building water treatment plant and installed in Unit 9 by the Contractor.
5. Portable Demineralizers – to be relocated within Unit 9 by the Contractor.
6. Water Meter – a 4" compound water meter and strainer that will be installed by GWP in a Contractor-supplied and -installed traffic rated vault with shutoff valves around the meter/strainer assembly.

F. CONTRACTOR SUPPLIED EQUIPMENT

The Contractor will be supplying the following equipment and materials:

1. Double-wide office trailer to serve as the temporary maintenance office.
2. Double-wide office trailer to serve as the temporary control room.
3. 480 V Outdoor Switchgear – Switchgear to feed the trailers, reverse osmosis system, the air compressor, and backup source to Unit 9 to be installed by the Contractor.
4. Air Compressor, [see Attachment 18] or approved equal. Delivery and installation of the air compressor is desired within the ninety (90) day construction period following Notice to Proceed. If necessary, due to manufacturing lead time, installation of the air compressor may occur after the ninety (90) day construction period but not later than 150 days.
5. Back Flow Preventer – a 4" horizontal reduced pressure zone backflow preventer with shutoff valves on either side that will be supplied and installed aboveground by the Contractor. Refer to approved equipment list referenced in the Service Water Description (Attachment 14).
6. 19" Rack – one 19" rack to be installed in the Control Room by the Contractor to receive City rack mounted equipment.

G. TECHNICAL REQUIREMENTS

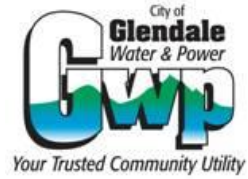
Refer to Attachments 2 through 34 for relevant drawings and technical requirements.

H. CITY'S SCOPE OF WORK

The following work will be performed by the City:

| City's Work Scope | Phase | | |
|--|-------|---|---|
| | 1 | 2 | 3 |
| Natural Gas and Landfill Gas Systems | | | |
| Isolate natural gas to Units 1-5, 8A, and 8BC. | | X | X |
| Service and Instrument Air | | | |
| Modify plant control system (if needed) to control temporary air compressor. | | X | X |

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Attachment 1 – Scope of Work



| City's Work Scope | Phase | | |
|---|-------|---|---|
| | 1 | 2 | 3 |
| Commission and test air compressor in conjunction with Contractor. | | | |
| Potable and Fire Water | | | |
| Install new service water meter and strainer. | | X | |
| Water Treatment | | | |
| Modify plant control system to control reverse osmosis system. Commission and test reverse osmosis system in conjunction with Contractor. | | X | |
| 69 kV System | | | |
| Open the breakers and cut the cables for the Unit 8A and Unit 8BC 69/13.8 kV transformers | | X | X |
| Open the breakers and cut the cables for the two 69/34.5 kV tie transformers. This will turn off power to the Boiler Building and the Glendale Rack. Note that doing this work will separate Units 1-5 from the GWP distribution system and remove power from the Boiler Building. | | | X |
| 34.5 kV System | | | |
| Disconnect one 34.5/12 kV transformer | X | | |
| 4 kV System Plant Distribution | | | |
| Electrically isolate and determ the feed to Well Water Pump #2 | X | X | X |
| 480 V System Plant Distribution | | | |
| Electrically isolate and determ the feed to Well Water Pump #1 | X | X | X |
| 480 V Temporary Unit 9 Service | | | |
| Install pole mount 4 kV disconnect and pad mount 4 kV / 480 V three phase transformer and primary cabling between pole and transformer and feed secondary cabling from transformer into metering section of switchboard. | X | X | |
| Telecommunications | | | |
| Relocate the City computers and phone system to the new temporary trailer control room. | | X | X |

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Attachment 1 – Scope of Work

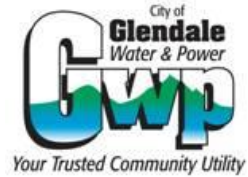


I. CONTRACTOR'S SCOPE OF WORK

The following Work will be performed by the Contractor. Where Work is indicated as taking place in more than one phase, the Contractor has their choice of when to perform the Work provided that the Work is completed in accordance with the deadline for completion specified in the Contract Documents.

| Contractor's Work Scope | Phase | | |
|--|-------|---|---|
| | 1 | 2 | 3 |
| Temporary Trailers | | | |
| Prepare site and install temporary trailers for control room and offices. Install temporary above-ground potable water lines with protective covers for vehicle traffic to provide water to the trailers. | X | | |
| 480 V Temporary Unit 9 Service | | | |
| Install Contractor-supplied 480 V outdoor switchgear Terminate 480 V feeder to switchgear. 12 kV feeder disconnect will be under the operational control of GWP and controlled under LOTO program. Install conduit and cable to provide 480 V backup feeder to Unit 9 Power and Control Enclosure (PACE). | X | X | |
| Terminate cables in the 480 V switchgear. | | X | |
| Supply and install precast pads for transformer and gear. Supply and install outdoor-rated gear, and all necessary underground conduit between pole, transformer and gear. Termination of secondary cabling by Contractor in the metering section to be approved by GWP. Supply and install conduit and cable to distribute 480V power to the temporary U9 loads. Terminate cables not requiring an outage. | X | | |
| Terminate cables requiring an outage. | | X | |
| Natural Gas and Landfill Gas Systems | | | |

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| Contractor's Work Scope | Phase | | |
|---|-------|---|---|
| | 1 | 2 | 3 |
| Provide purge plan for GWP review. Purge the natural gas piping between the SoCalGas south meter station and the Boiler Building (Boilers 1-5). Purge the landfill gas system downstream of the knockout vessel located adjacent to the metering station. Blind flange or cut natural gas piping at the meter station and cap the pipe exiting the meter station. Blind flange or cut the natural gas piping in the vault on the south side of the Boiler Building. Purge the natural gas piping between the SoCalGas north meter station and Units 8A and 8BC. Blind flange or cut natural gas piping at the meter station and cap the pipe exiting the meter station. | | X | X |
| Service and Instrument Air | | | |
| Disconnect the Unit 9 compressed air system from the existing plant and cap both sides. Supply and install temporary electric driven air compressor and connect to the Unit 9 compressed air system. | X | X | X |
| Fabricate interconnecting piping. Install cable and conduit for 480 V power from compressor location to Temporary Unit 9 Service switchgear. | X | | |
| Install interconnecting piping. Close isolation valve and blind flange open end if air compressor is not yet available. Terminate 480 V power at Temporary Unit 9 Service switchgear. | | X | |
| Support commissioning of air compressor. | | X | X |
| Potable and Fire Water | | | |
| Pre-fabricate piping. Pot-hole and expose piping to be modified. | X | | |

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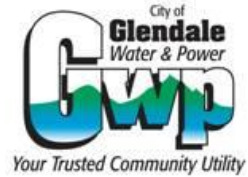
| Contractor's Work Scope | Phase | | |
|--|-------|---|---|
| | 1 | 2 | 3 |
| <p>Tie in new Unit 9 fire water/service water supply and install new traffic rated meter vault, aboveground horizontal reduced pressure zone backflow preventer, and isolation valves.</p> <p>Install a new 8" fire water line that extends an existing 8" fire water line from the northeast corner of the Cooling Tower #5 to supply an existing 6" fire water line that supplies a hydrant that is located on Fairmont Ave. (other side of the facility perimeter wall).</p> <p>Install a 6" lateral with a shutoff from the newly extended 8" fire water line and install a new fire hydrant with an isolation valve northwest of Cooling Tower #5.</p> <p>Install a fire hydrant to near the south side of Cooling Tower #2 and a 6" fire water line with an isolation valve.</p> <p>Pressure test all new fire water piping.</p> <p>Note that this is a significant work item within the two-week work window.</p> | | X | |
| Well Water Pump #1 | | | |
| Remove and salvage (turnover to GWP for storage) the motor, pump, pump column and shaft; secure the top of the well casing with a lockable cover; and, cap the discharge pipe. | X | X | X |
| Well Water Pump #2 | | | |
| Remove and salvage (turnover to GWP for storage) the motor, pump, pump column and shaft; secure the top of the well with a lockable cover; and, cap the discharge pipe. | X | X | X |
| Install temporary K-rails to protect well. | X | X | X |
| Process Sewer | | | |
| Reroute the two Unit 9 process sewer lines and tie them into the Blow-off Box manhole. | | X | |
| <p>Seal all of the existing incoming lines connecting to the Blow-Off Box just west of the Unit 9 stack. Protect-in-place outgoing 16" VCP line to the wet well.</p> <p>Temporarily seal/plug all incoming/outgoing lines at the outfall Junction Box which is located between and south of Cooling Towers #1 and #2.</p> <p>Blind Cut and cap both ends of the stainless steel process sewer diversion line before it goes underground just east of the junction box along the south fence.</p> | | X | X |
| Water Treatment | | | |

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| Contractor's Work Scope | Phase | | |
|--|-------|---|---|
| | 1 | 2 | 3 |
| Prepare Unit 9 site for the temporary reverse osmosis and demineralizer system Run temporary conduit for 480 V power from reverse osmosis skids location to Temporary Unit 9 Service switchgear. Install cable and conduit to power the reverse osmosis system, demineralizer (DI) vessels, and chemical injection skids. Fabricate new piping/hoses in place of what cannot be re-used. | X | | |
| Relocate Reverse Osmosis skids, DI vessels, and chemical injection skids from Boiler Building water treatment area to Unit 9. Install piping and hoses. Flush and prepare system for operation in consultation with the City. Support commissioning and testing of the reverse osmosis system. | | X | |
| Controls | | | |
| Install conduit necessary to reroute the Unit 9 electrical protection circuits going to the Kellogg GIS out of the Glendale Rack. Pull new cable for new electrical protection circuits. Determine old electrical protection circuits, remove cables, and terminate new electrical protection circuits. Relocate Unit 9 turbine and balance-of-plant HMIs, CEMS DAHS, e-stop, fire protection panel, emergency siren control, and outfall monitor from Boiler Building to the temporary trailer control room. Install new cable and conduit for Unit 9 data circuits between the Unit 9 PACE and the temporary control room. | | X | |
| Fencing | | | |
| Add fencing (and ground it) around the north end of the Unit 9 Generator Step-Up transformer. | | X | |
| Security Cameras | | | |
| Install cable, conduit, and up to two of the retained security camera(s) on the south side of Verdugo Wash and tie into the existing camera system. Remove and retain three security cameras atop the Boiler Building. | X | X | X |

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| Contractor's Work Scope | Phase | | |
|---|-------|---|---|
| | 1 | 2 | 3 |
| Relocate the security camera circuits in the East Road and Glendale Rack areas out of these areas by installing new conduit, fiber optic cables, and patch panel(s) between the communications building, existing field patch panel(s), and the temporary control room. Relocate security camera system from the Boiler Building control room to the new temporary trailer control room. Terminate and test terminations. | | X | X |
| Telecommunications | | | |
| Install new fiber, patch panels as necessary, and conduit between the temporary Control Room Trailer, temporary maintenance office trailer, and the Communications Building. Install new conduit and fiber cable from temporary Control Room Trailer to the Kellogg GIS Control House. Terminate and test terminations. | X | X | |
| Relocate the net metering system from the Boiler Building control room to the new temporary trailer control room. | | X | |
| Field identify circuit for operating the facility emergency sirens and relocate service into temporary control room. | X | X | X |
| Field locate single-line phone system tie; install cable and conduit between Unit 9 PACE and the temporary control room; and wire temporary control room for up to two phones. | | X | X |
| Grounding | | | |
| Install two new ground rods for Unit 9 and tie to the Unit 9 ground grid. | X | X | |
| Install grounding for new GSU fence | | X | |
| Disconnect Unit 9 ground grid and Kellogg GIS ground grid from the balance of plant. Test Unit 9 and Kellogg GIS ground grids using Fall Off Potential method and provide report. | | X | X |